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including a cylindrical seal in engagement with a one-way valve disc and having back-pressure relief passages in communication with a relief hole located in the inlet conduit for the relief of any back pressure.

Cancel claims 40, 41 and 42.

REMARKS

The specification has been amended on page 13, line 16, to avoid the noted objection. And, the specification has been amended on page 12, line 13, to more specifically refer to hole 80 as a relief hole. No new matter is thereby introduced.

Claim 1 has been amended to define the control valve 27 as having a carrier liquid duct 34 for interconnecting carrier liquid inlet passage 23, and a chemical liquid duct 35 for interconnecting chemical liquid inlet passage 24 with passage 23, both said ducts 34 and 35 being integrally formed in valve 27. And, valve 27 is claimed as manually rotatable about an axis which lies perpendicular to both carrier liquid duct 34 and chemical liquid duct 35. By such an arrangement control valve 27 can be manually rotated between On and Off positions, and in the Off position both carrier liquid inlet passage 23 and chemical liquid inlet passage 24 are positively closed. This avoids any leakage through the chemical liquid inlet passage and permits that passage to be positively closed with only a slight degree of rotation of the control valve so as to readily permit other functions such as rinsing which is another claimed feature of the invention.

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Claims 22 to 24 directed specifically to handle 52 on the sprayer housing, have been cancelled.

Claim 25 has been amended to define rotatable nozzle 55 as having a pair of spaced apart sloping walls 56, 57 with opposing sides 58, 59, respectively, thereof lying in the path of discharge passage 26 upon rotation of the nozzle so as to divert the flow of liquid from the discharge passage to thereby effect flat spray patterns in selected directions upon nozzle rotation. Claim 26 has been cancelled, and claim 27 now depends from amended claim 25.

Claim 29 has been amended to define nozzle 55 as having a pair of spaced apart walls 56, 57 with respect to opposing surfaces, 58, 59 lying in the path of discharge passage 26 in different rotative positions to effect spray patterns upon deflection in different directions. Both walls 56 and 57 likewise lying out of the path of discharge passage 26 as shown in Fig. 5 in another rotative position to thereby permit a stream pattern discharge. Claim 30 has been cancelled, claim 31 now depends from claim 29, and claim 32 has been accordingly amended.

Claim 33 has been amended to now depend from claim 1, and further defines dip tube retainer 83 coupled to depending support sleeve 82. Claim 34 has been amended to incorporate the allowable subject matter of claim 38 which has now been cancelled. Claim 39 has been amended to define, inter alia, that anti-siphon assembly 61 includes a cylindrical seal 73 in engagement with a one-way valve disc

66 and has back-pressure relief passages 75, 76 in communication with a relief hole 80 located in inlet conduit 65 for the relief of any back pressure.

Claims 40 to 42 have been cancelled.

All the claims remaining in the application, namely, 1 to 22, 25, 27 to 29, and 31 to 39 are believed to patentably distinguish the invention over the cited art of record, whether the references are considered alone or in combination.

For example, the 4,901,923 patent to McRoskey discloses a hose-end sprayer having a control valve 55 with but a single bore 66 which, when aligned with carrier liquid inlet passage 63, aspirates the chemical liquid through ports 80, 86 for discharge of aspirated liquid through discharge passage 21. Upon manual rotation of valve 55 with its bore 66 out of alignment with inlet passage 63, the liquid inlet passage is closed but the chemical inlet passage 80 remains open. Unlike that set forth positively in amended claim 1, there is no chemical liquid duct integrally formed in valve 55 as for the purpose and in the manner of the invention.

The 3,186,643 patent to George et al., discloses a hose-end sprayer with a control valve 26 having integrally formed therein a carrier liquid duct 34b and a chemical liquid duct 36. Dip tube 40 which extends into the container is suspended directly from a sleeve 42 on the control valve. Thus, rotation of the control valve from its Fig. 4 open position to its Fig. 5 closed position blocks entry of liquid through passage 66, although the chemical inlet duct and passage 36 remains open since the rotational axis of the control valve is co-axial with the chemical inlet duct and

passage. The chemical and water inlet ducts which are integrally formed with control valve 27 of the invention, on the other hand, are capable of shutting off the flow of both carrier liquid and any residual flow of chemical liquid upon manual rotation of the valve, unlike that of control valve 26 of George et al. The control valve of the invention is rotatable about an axis which lies perpendicular to both its duct 34 and its duct 35, whereas control valve 26 of George et al. is rotatable about axis coincident with the chemical inlet duct. Moreover, rotation of the control valve according to George et al. undesirably rotates the dip tube about its axis which, since it is customarily curved as shown, will be rotated from a predetermined and preferred forwardly extending position each time the valve is rotated between open and closed positions.

The 4,369,921 patent to Beiswenger et al. discloses a hose-end sprayer having a control valve 16 which is rotatable about an axis not perpendicular to both ducts 21, and 25 as claimed, but rather about an axis parallel to duct 25. Such an arrangement, which cannot give rise to the rinsing and other features of the invention, is of relatively complex construction requiring support plate 33 for dip tube 37 to be sealed relative to through duct 21 of the control valve, and offset from the rotational axis thereof. Otherwise, in a simplified version of the prior art hose-end sprayer shown in Fig. 12 of the patent, the dip tube is mounted directly to inlet 36 so as to rotate together therewith upon control valve rotation, which is undesirable.

Patent 4,750,674 to Chow et al. discloses a hose-end sprayer which does not have a rotatory control valve as in the invention, but which rather is permanently

attached to the container in which the chemical material to be aspirated is received. The prior art sprayer therefore appears not relevant to the present invention.

Patent 5,100,059 to Englhard discloses a hose-end sprayer in which the control valve 34 has a carrier liquid duct 62 and an aspiration duct 30 integrally formed in the valve, except that such ducts do not interconnect inlet passage 82 with inlet passage 70, as claimed. Instead aspiration passage 30 is connected with passage 38 and opening 86 such that aspiration takes place well downstream of the control valve at 43. Moreover, the control valve of Englhard is not rotatable about an axis which lies perpendicular to both a carrier liquid duct and the chemical liquid duct thereof, as claimed.

Since each and every element of the invention as now claimed in amended claim 1 is not found in any of the references of record as discussed above, none of these references qualifies as 102 references. The rejections on this basis should therefore be withdrawn. Moreover, claim 1 is believed defined in a patentably distinguishable manner over each of the applied references whether considered alone or in combination, together with dependent claims 2 to 10, 12 and 15 to 21. Respecting dependent claims 11, 13 and 14, it is pointed out that the 3,255,972 patent to Hultgren et al. which merely discloses a handle 21 provided for a disposable container in no way supplies the deficiencies discussed above in respect of the principle reference, patent 4,901,923, which discloses a rotatable control valve having only a carrier liquid duct formed integrally therein, unlike that specifically required by claim 1 from which claims 11, 13 and 14 depend. The combination of

references in the rejection of these claims is therefore improper and should be withdrawn.

Concerning amended claim 25, McRoskey discloses a nozzle comprising a fixed deflector plate 19 which is presumably rotated as part of nozzle assembly 22 to discharge spray in a desired direction (see col. 7, ll. 45 to 55 of the patent). However, the nozzle does clearly not have a pair of spaced apart sloping walls with opposing sides respectively lying in the path of the discharge passage upon nozzle rotation for diverting flow of liquid from that passage to effect flat spray patterns respectively in selected directions, as for the purpose and in the manner of the invention. In other words, the hose-end sprayer according to the reference is clearly devoid of spaced apart sloping liquid flow deflecting walls as claimed and as illustrated in Figs. 2 and 3 of the present application for effecting spray pattens in selected directions from opposing sides, respectively, with sloping walls, as claimed.

George et al. likewise discloses but a single curved deflector plate 46 rotatable mounted for deflecting the discharged liquid to any desired area. Thus, a pair of spaced apart sloping walls for opposing sides respectively lying in the liquid discharge path upon nozzle rotation as for the purpose and in the manner of the invention, are not disclosed by this reference.

Beiswenger et al. likewise discloses but a single baffle plate 61 which is mounted by a live hinge 64 such that upon rotation of spray nozzle head 10 cams 59

and 60 change the deflection of the plate relative to the axis of the discharge to thereby vary the spray. Again, this is unlike that claimed in amended claim 25 in which the rotatable nozzle has a pair of spaced apart sloping walls with opposing sides respectively lying in the path of the discharge upon nozzle rotation for simply and efficiently directing the spray upon nozzle rotation. Also with respect to claim 29, Beiswenger cannot provide for a discharge of a stream pattern from the discharge passage as in the invention since baffle plate 61 constantly remains in the path of the discharge irrespective of its rotative position relative thereto. And, the nozzle does not include a pair of spaced apart sloping walls as claimed fro the purpose of the invention.

Gunzel et al. discloses a rotatable turret 28 having four nozzles 20 to 26 such that when rotated into alignment with discharge passage 104, spray in up or down directions is effected as well as a stream spray depending on the nozzle aligned with the discharge. The deflecting and sloping surfaces of the nozzles 20 and 22, however, do not lie in the path of the discharge with respective opposing surfaces thereof as in the invention. With such an arrangement, the nozzle can be rotated into such a position where the walls lie completely out of the path of the discharge passage to thereby permit a stream pattern discharge, as shown in Fig. 5. Instead, in Gunzel et al. a separate nozzle 24 or 26 must be provided to effect a stream discharge which obviously is much more complicated and costly compared to that of the invention.

The Chow et al. sprayer includes a head moveable between a first position in

which the container interior is sealed and a second position in which the container interior is unsealed and aspiration occurs, the making of the seals and flow connection are accomplished by a plurality of seal cups 118 and 104 moved by the head. There is no rotatable nozzle having a pair of spaced apart deflecting walls as for the purpose and in the manner of the claimed invention.

Englhard et al. provides for an upwardly inclined deflector wall 46 for upwardly deflecting the spray from the discharge. Clearly there are no pair of spaced apart walls respective as having opposing surfaces lying in the path of the discharge as in the invention, which gives rise to a stream pattern when these walls are rotated so as to lie not in the path of the discharge, as claimed.

Claim 33 has been amended to now depend from claim 1, such that the rejection of original claim 33 should be withdrawn.

Claim 34 has been amended to incorporate the allowable subject matter of claim 38, and claim 37 has been accordingly amended.

Claim 39 has been amended to define anti-siphon assembly 61 as including a cylindrical seal 73 in engagement with a one-way valve disc 66 and having a back-pressure relief passages 75, 76 in communication with a relief hole 80 (Fig. 3) located in inlet conduit 65 for the relief of any back pressure. Provision for back pressure relief is not provided by either McRoskey et al. or George et al., the references separately applied against original claim 39. The rejections should therefore be withdrawn.

Claims 40 to 42 have been withdrawn.

The claims have been amended to define the invention as exemplified by all its features in a manner which patentably distinguishes over each of the several applied references of record, whether taken singly or in combination. It is respectfully requested that claims 1 to 21, 25, 27 to 29, 31 to 37, and 39 be allowed so that the entire case may be passed to early issuance.

Attached is a marked-up version of the changes made to the specification and claims by the current Amendment.

Respectfully submitted,

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VERSION OF THE CHANGES MADE TO THE SPECIFICATION

IN THE SPECIFICATION:

Page 12, line 13.

In operation, the carrier liquid through hose 22 inlets openings 69, expanding the central portion of disc valve 66 permitting downstream flow through inner sleeve 77 of seal 73. Any flow in an upstream direction is blocked as the central valve area of disc 66 seats tightly against imperforate center section 71 of flow regulator 68. Also upon creation of any back pressure the same is relieved through notches 75 of cylindrical seal 73 and escapes in a downstream direction via cutouts 76 and through a relief hole 80 provided in the housing 21 (see Fig. 3).

Page, 13, line 16.

Cylinder 84 of the tube retainer has an upper end wall 86 containing an inlet port 87 coaxial with inlet passage 24 [39]. Thus in an open position of the valve the chemical is aspirated up the dip tube and into the liquid carrier stream via inlet ports 87 and 24 and duct 35. A given chemical-to-water ratio can be determined by the size of inlet port 87 in the inner wall of the dip tube retainer. For a smaller chemical/water ratio a dip tube retainer having a smaller diameter inlet port 87 will be made available giving instruction to the user to simply replace one for the other. Of course should a larger chemical/water ratio is desired, a dip tube retainer having a larger diameter inlet port 87 will be made available to the user with instructions to replace that tube retainer.

VERSION OF THE CHANGES MADE TO THE CLAIMS

IN THE CLAIMS:

1. (Amended) A sprayer assembly for connection to a container of a liquid chemical to be diluted upon aspiration by a pressurized stream of carrier liquid, comprising: a housing having a carrier liquid inlet passage, a chemical liquid inlet passage and a discharge passage; a [manually rotatable] valve mounted within said housing having means for interconnecting said inlet passages in a first rotative position of the valve, said means comprising a carrier liquid duct and a chemical liquid duct both integrally formed in said valve and opening into said carrier liquid duct, said valve being manually rotatable about an axis perpendicular to both said carrier liquid duct and said chemical liquid duct, and said valve having means for closing the inlet passages in a second rotative position of the valve.

Cancel claims 22, 23, 24.

25. (Amended) A sprayer assembly for connection to a container of a liquid chemical to be diluted upon aspiration by a pressurized stream of carrier liquid, comprising a housing having a discharge passage, means mounted on said housing comprising a rotatable nozzle having a pair of spaced apart sloping walls with opposing sides respectively lying in the [having at least one sloping wall lying along a] path of said passage upon nozzle rotation for diverting flow of the liquid from said discharge passage to effect [a] flat spray patterns respectively in selected directions

upon nozzle rotation [pattern in one direction].

Cancel claim 26.

27. (Amended) The sprayer assembly according to claim 25 [26], wherein said walls have roughened surfaces for dispersing the diverted liquid flow.

29. (Amended) A sprayer assembly for connection to a container of liquid chemical to be diluted upon aspiration by a pressurized stream of carrier liquid, comprising a housing having a discharge passage through which the carrier liquid is discharged, a nozzle mounted on said housing at said discharge passage for rotation between stream and spray positions, said nozzle having [at least one] a pair of spaced sloping [wall] walls with respective opposing surfaces thereof lying in the path of said discharge passage[,] in different [one] rotative [position] positions to effect [a] spray [pattern] patterns upon deflection in [one direction] different directions, said [wall] walls lying out of the path of the discharge passage in another rotative position to permit a stream pattern discharge.

Cancel claim 30.

31. (Amended) The sprayer assembly according to claim 29 [30], wherein surfaces of said walls lying in said path are roughened for dispersing the spray.

32. (Amended) The sprayer assembly according to claim 29, wherein the nozzle has an axis offset from an axis of the discharge nozzle[, an outer surface of one of the walls deflecting the spray in one direction and an inner surface of the other of the walls deflecting the spay in another direction].

33. (Amended) [A] The sprayer assembly according to claim 1, wherein [for connection to a container of chemical liquid to be diluted upon aspiration by a pressurized stream of carrier liquid, comprising a housing having a discharge passage through which the carrier liquid is discharged,] said housing has [having] a chemical liquid inlet opening and a depending support sleeve 82 coaxial with said opening, a dip tube retainer 83 coupled to said sleeve, said retainer having a cylindrical wall in frictional engagement with said sleeve, said cylindrical wall suspending a dip tube extending into the container, and said retainer having a transverse wall lying adjacent said inlet opening, said transverse wall having an inlet opening in open communication with said dip tube, said orifice having a predetermined size to effect a given chemical liquid-to-carrier liquid ratio.

34. (Amended) A sprayer assembly for connection to a container of chemical liquid to be diluted upon aspiration by a pressurized stream of carrier liquid, comprising a housing having carrier liquid and chemical liquid inlet passages extending [in] into a cylindrical bore and a discharge passage extending from said bore, said bore extending transversely to said passages, a cylindrical valve coaxial

with and mounted in said bore for rotation about a central axis thereof between on and off positions, said valve having annular seal rings adjacent opposite ends in engagement with said bore, the entirety of said valve being of an injection molded polymeric material, the seal rings being of a co-injected material interconnected by channels provided during co-injection formation, and at least the material forming the seal rings being softer and more compliant compared to the material forming the valve.

37. (Amended) The sprayer assembly according to claim 36, wherein [the seal rings and] the closing means are of co-injected material interconnected by channels provided during co-injection formation.

Cancel claim 38.

39. (Amended) A spray assembly for connection to a container of chemical liquid to be diluted upon aspiration by a pressurized stream of carrier liquid, comprising a housing having an inlet conduit defining a carrier liquid inlet passage, a coaxial discharge passage, and a perpendicular related chemical liquid inlet passage, means for coupling said [carrier liquid] inlet [passage] conduit to a pressurized water source, said coupling means and said inlet conduit containing an [including] anti-siphon assembly [means] permitting only one way flow of carrier liquid into said carrier liquid inlet passage, said assembly including a cylindrical seal in engagement with a one-way valve disc and having back-pressure relief passages in

communication with a relief hole located in the inlet conduit for the relief of any back pressure.

Cancel claims 40, 41 and 42.